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EXAMINER	
CHAWAN, VIJAY B	
ART UNIT	**PAPER NUMBER**
2654	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/831,843	Applicant(s) GOTTESMAN, ODED	
	Examiner Vijay B. Chawan	Art Unit 2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _14 March 2005_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-34_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-34_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to amendment filed 3/14/2005.

Claim Objections

2. Claims 12, 17-19, 21-28 are objected to because of the following informalities:

- In claim 12, the limitation "optionally using accumulated spectrally weighted distortion" is indefinite, because the term "optionally" is indefinite, because it is unclear whether the limitation should be considered as being positively recited in the claim or not.
- In claim 17, the limitation "optionally some weight associated with their probability" is indefinite, because it is unclear whether the limitation should be considered as being positively recited in the claim or not.
- In claim 22, the limitation "optionally using temporal weighting, and optionally using a switch predictive synthesis filter or predictor" is indefinite, because it is unclear whether the limitation should be considered as being positively recited in the claim or not.
- In claim 25, the limitation "or other relevant measure" is indefinite, because it is unclear whether the limitation should be considered as being positively recited in the claim or not

Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-33 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-33 define non-statutory processes because they merely manipulate an abstract idea (mathematical algorithm) without a claimed limitation to a practical application. The disclosed invention has a practical application in the technological arts (e.g encoding/quantizing speech waveforms); however, the claimed process, a series of steps to be performed on a computer, simply manipulates an abstract idea without a claimed limitation to the practical application and does not have any post or pre computer process activity.

The disclosed invention of the instant application pertains to a method of interpolative coding input signals, with said signals decomposed into or are composed of a slowly evolving waveform and other attributes or components, which is a manipulation of an abstract idea without any limitation to a practical application.

Applicant should note, however, that claims directed to speech or audio signal processing, would be considered to be statutory subject matter. For example, the requirement of the measurements of physical objects or activities to be transformed

outside of the computer into computer data (In re Gelnovatch, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data- gathering step did not measure physical phenomenon); Arrhythmia, 958 F.2d at 1056, 22 USPQ2d at 1036), where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities. Schrader, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval Arrhythmia, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38; Abele, 684 F.2d at 909, 214 USPQ at 688; In re Taner, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

Examples of this type of claimed statutory process include the following:

- A method of using a computer processor to analyze electrical signals and data representative of human cardiac activity by converting the signals to time segments, applying the time segments in reverse order to a high pass filter means, using the computer processor to determine the amplitude of the high pass filter's output, and using the computer processor to compare the value to a predetermined value. In this example the data is an intangible representation of physical activity, i.e., human cardiac activity. The transformation occurs when heart activity is measured and an electrical signal is produced. This process has real world value in predicting vulnerability to ventricular tachycardia immediately after a heart attack.

- A method of using a computer processor to receive data representing Computerized Axial Tomography ("CAT") scan images of a patient, performing a calculation to determine the difference between a local value at a data point and an

average value of the data in a region surrounding the point, and displaying the difference as a gray scale for each point in the image, and displaying the resulting image. In this example the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays and the X-rays are converted into electrical digital signals that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.

- A method of using a computer processor to conduct seismic exploration, by imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the electrical signals processed by the computer represent reflected seismic energy. The transformation occurs by converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface. Geophysical exploration of formations below the surface of the earth has real world value.

Examples of claimed processes that independently limit the claimed invention to safe harbor include:

- a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals (Taner, 681 F.2d at 788, 214 USPQ at 679); and

- a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computer tomography scanner). Abele, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

Examples of claimed processes that do not limit the claimed invention to pre-computing safe harbor include:

- "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables (Gelnovatch, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process.... In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.")); and, selecting a set of

arbitrary measurement point values (Sarkar, 588 F.2d at 1331, 200 USPQ at 135). If a claim does not clearly fall into one or both of the safe harbors, the claim may still be statutory if it is limited to a practical application in the technological arts.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 11-33 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: It is not clear from the independent claims how the claimed method is to be executed, i.e., the claimed interpolative coding of the what input signals, and by what steps this coding is to performed.

8. Claims 11-33 provides for the use of interpolative encoding of the input signals, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite

where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 11-33 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

9. Claims 22-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 is directed to both a method and a system, and claims 23-28 depend upon claim 22 directly or indirectly.

A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. In Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990), a claim directed to an automatic transmission workstand and the method steps of using it was held to be ambiguous and properly rejected under 35 U.S.C. 112, second paragraph.

Such claims should also be rejected under 35 U.S.C. 101 based on the theory that the claim is directed to neither a "process" nor a "machine," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is

drafted so as to set forth the statutory classes of invention in the alternative only. Id. at 1551.

10. Claims 28 and 29 recite the limitation "said set" in line 1. There is insufficient antecedent basis for this limitation in the claim. Also in Claim 11, line 5, recitation of "the non-ideal interpolation" has insufficient antecedent basis.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Kleijn (5,517,595).

As per claims 1 and 3, Kleijn teaches the method for interpolative coding input signals said signals decomposed into or composed of a slowly evolving waveform and other attributes or components, the method incorporating at least one of the following steps:

(a) analysis-by-synthesis of the slowly evolving waveform such that it minimizes or reduces the effect of the non-ideal interpolation of adjacent waveforms(Col.2, lines 52-56);

(b) analysis-by-synthesis quantization of the dispersion phase such that the linear shift phase attribute is reduced or eliminated from the quantization (Col.2, lines 52-56);

(c) processing a group of adjacent pitch values and weighting them to compute a weighted average in order to compute the most probable value of pitch (Col.4, lines 1-7, Col.5, 14-23);

(d) incorporating spectral and temporal pitch searches, such that the temporal search is performed at a different rate then the spectral search (Col.5, line 14 – Col.6, line 20);

(e) incorporating temporal weighting in the analysis-by-synthesis vector quantization of the gain sequence (Col.10, lines 52-60);

(f) quantizing adjacent values by analysis-by-synthesis vector-quantization without downsampling or interpolation of the gain values (Col.5, line 62 – Col.6, line 50); and,

(g) incorporating switch prediction or switched filtering in the analysis-by-synthesis vector-quantization of the gain sequence (Col.5, line 62 – Col.6, line 50);

(h) using a coder in which a plurality of bits therein are allocated to the vector-quantization of the dispersion phase of the slowly evolving waveform phase from which the linear shift attribute was reduced or removed (Col.5, line 62 – Col.6, line 50); and,

(i) pitch searching using varying boundaries of the summations used in computing the similarity or an equivalent distortion measure used for the pitch search (Col.5, line 14 – Col.6, line 20).

As per claim 2, Kleijn teaches the method of claim 1, in which said signal is speech (Col.3, lines 65-67).

As per claim 3, Kleijn teaches the method of claim 1, in which said method incorporates each of steps (a) through (i) (Col.2, lines 52-56, Col.4, lines 1-7, Col.5, 14-23, Col.5, line 14 – Col.6, line 50, Col.10, lines 52-60).

As per claim 4, Kleijn teaches the method of claim 1, in which, in the step of analysis-by-synthesis vector quantization of the slowly evolving waveform, distortion is reduced in the signal by obtaining the accumulated weighted distortion between a sequence of input waveforms and a sequence of quantized and interpolated waveforms (Col.11, line 60 –Col.12, line 52).

As per claim 5, Kleijn teaches the method of claim 1 including a system for providing at least one codebook containing magnitude and phase information for predetermined waveforms, and in which the step of analysis-by-synthesis quantization of the dispersion phase is conducted by crudely aligning the linear phase of one or the other of the input and output, then iteratively shifting said crudely aligned linear phase input or output, comparing the shifted input to a plurality of waveforms reconstructed from the magnitude and phase information contained in said at least one codebook, and selecting the reconstructed waveform that best matches one of the iteratively shifted inputs or outputs (Col.13, lines 45-65, Col.14, lines 15-35).

As per claim 6, Kleijn teaches the method of claim 1, in which, in the method of searching the temporal domain searching the instantaneous pitch period in said step comprises defining boundaries of segments of said summations used to compute similarity or an equivalent distortion measure for pitch search, selecting the best boundary such that maximizing the similarity, or minimizing the distortion, measure by iteratively shifting and by changing the length of the segments used for the summations used in the measure computations (Col.13, line 45 – Col.14, line 61).

As per claim 7, Kleijn teaches the method of claim 1, in which, the spectral domain pitch and temporal domain pitch searches, are conducted respectively at different rates (Col.10, lines 24-29).

As per claim 8, Kleijn teaches the method of claim 1, in which, the step of the temporal weighting in the analysis-by-synthesis vector quantization of the signal gain is changed as a function of time whereby to emphasize local high energy events in the input signal (Col.14, lines 42-46).

As per claim 9, Kleijn teaches the method of claim 1, in which, selection between the high and low correlation synthesis filters in the analysis-by-synthesis vector quantization of the signal gain is made to maximize similarity or other meaningful objective between the input target gain vector and a reconstructed vector (Col.14, lines 50-61).

As per claim 10, Kleijn teaches the method of claim 1, wherein each value of gain in the analysis-by-synthesis vector quantization of the signal gain is used to obtain a plurality of shapes, each composed of a predetermined codebook having a number of

entries, and comparing said shapes to an input target vector and selecting the reconstructed shape that maximizes the similarity of the input target vector (Col.17, lines 31-56).

As per claim 11, Kleijn teaches a method for interpolative coding input signals at low data rates in which said signals decomposed into or are composed of a slowly evolving waveform and other attributes or components, the method incorporating analysis-by-synthesis vector quantization of the slowly evolving waveform such that it minimizes or reduces the effect of the non-ideal interpolation of a group of adjacent waveforms (Col.2, lines 36-65).

As per claim 12, Kleijn teaches the method of quantizing waveforms using the accumulated distortion between adjacent input waveforms to adjacent quantized and interpolated output waveforms, optionally using accumulated spectrally weighted distortion (Col.2, lines 36-65).

As per claim 13, Kleijn teaches a method for interpolative coding in which the signal decomposed into or composed of attributes or components one of which is a slowly evolving waveform which has or from which one can extract a linear dispersion phase, the method incorporating analysis-by-synthesis quantization of the dispersion phase (Col.2, lines 36-65).

As per claim 14, Kleijn teaches the method of claim 13, including providing at least one codebook containing magnitude and dispersion phase information for predetermined waveforms, and in which the step of analysis-by-synthesis quantization of the dispersion phase is conducted by crudely aligning the linear phase of the input,

then iteratively shifting said crudely aligned linear phase input, and/or comparing the shifted input, or equivalently shifting the quantized vector, to a plurality of vectors reconstructed from the magnitude and dispersion phase information contained in said at least one codebook, and selecting the reconstructed vector that best matches one of the iteratively shifted input vectors (Col.13, lines 45-65, Col.14, lines 15-35).

As per claim 17, Kleijn teaches a method for interpolative coding input signals, comprising using spectral and temporal pitch searches, computing a number of adjacent pitch values and optionally some weight associated with their probability, and then computing the most probable pitch value by computing the weighted average pitch value using the above said weight (Col.4, lines 1-7, Col.5, lines 14-23).

As per claim 18, Kleijn teaches the method of claim 17, in which the method of searching the temporal domain pitch comprises defining a boundary for a segment used for the summations in the computed measure used for the pitch search, selecting the boundaries of the segment that that maximize the similarity, or minimize the distortion measure, used for the pitch search, by iteratively shrinking and expanding the segment and by shifting the segment (Col.10, lines 52-60).

As per claim 21, Kleijn teaches the method of claim 19, in which, the spectral domain pitch and temporal domain pitch searches, in said step of locking onto the most probable pitch period of the signals, are conducted respectively at 100 Hz and 500 Hz (Col.10, lines 24-29).

As per claim 22, Kleijn teaches a method and a system for vector quantization of the signal gain sequence using analysis-by-synthesis optionally using temporal

weighting, and optionally using a switch predictive synthesis filter or predictor(Col.5, line 62 – Col.6, line 50).

As per claim 23, Kleijn teaches the method of claim 22, in which the temporal weighting is changed as a function of time whereby to emphasize local high energy events in the input signals (Col.14, lines 42-46).

As per claim 24, Kleijn teaches the method according to claim 22, comprising applying synthesis filter or predictor, which introduces selected high correlation or low correlation to a vector quantizer codebook in the analysis-by-synthesis vector quantization of the signal gain sequence whereby to add selected self correlation to the codebook vectors (Col.2, lines 36-62, Figures, 10, 11, 13, 14).

As per claim 25, Kleijn teaches the method of claim 24, in which selection between the high and low correlation synthesis filters or predictor is made to maximize similarity or relevant measure between the signal vector and a reconstructed (Col.14, lines 50-61).

As per claim 26, Kleijn teaches the method of claim 22, comprising using each value of gain in the analysis-by-synthesis vector quantization of the signal gain (Fig.14, item 501).

As per claim 27, Kleijn teaches the method of claim 22, wherein each value of gain is used to select from a plurality of shapes and associated predictors or filters, each of which is used to generate an output shape vector, and comparing the output shape vector to an input shape vector (Col.17, lines 31-56)

As per claim 28, Kleijn teaches the method of claim 27, in which said predetermined number of number of values is in the range of 1 to 50 (Col.13, lines 31-33).

As per claim 29, Kleijn teaches the method of claim 33, in which said predetermined number of number of values is in the range of 1 to 50 (Col.13, lines 31-33).

As per claim 30, Kleijn teaches a method for interpolative coding input signals in which said signals decomposed into or are composed of a slowly evolving waveform and other attributes or component, comprising using a coder in which a plurality of bits therein are allocated to the vector-quantization of the dispersion phase of the slowly evolving waveform phase from which the linear shift attribute was reduced or removed (Col.14, lines 8-61, Col, lines 16-27).

As per claim 31, Kleijn teaches the method of claim 30 in which at least one bit is allocated to the dispersion phase (Col.16, lines 16-27).

Claims 15, 16, 19, 20,32-34 are similar in scope and content of the method claims above and are rejected under similar rationale.

Response to Arguments

13. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vijay B. Chawan whose telephone number is (571) 272-7601. The examiner can normally be reached on Monday Through Friday 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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